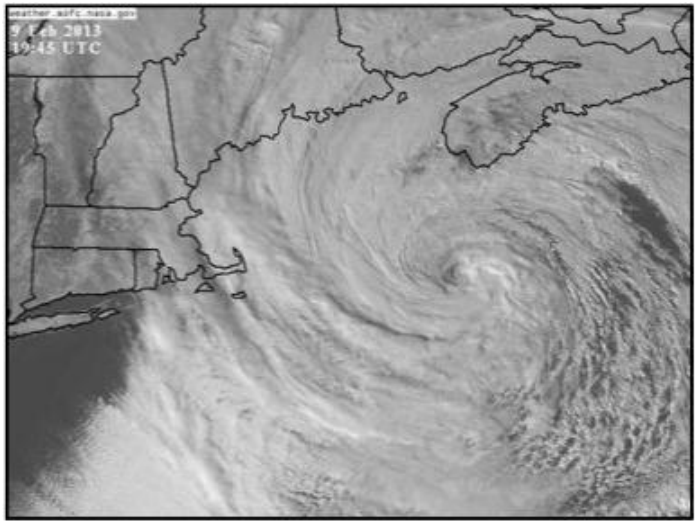
Cape May County

New Jersey

2014 Emergency Preparedness Conference

Tuesday, June 3, 2014
The Wildwoods Convention Center
4501 Boardwalk
Wildwood, New Jersey 08260

A Look back at Winter 2013-2014



A Look ahead to the 2014 Hurricane Season

Jim Eberwine

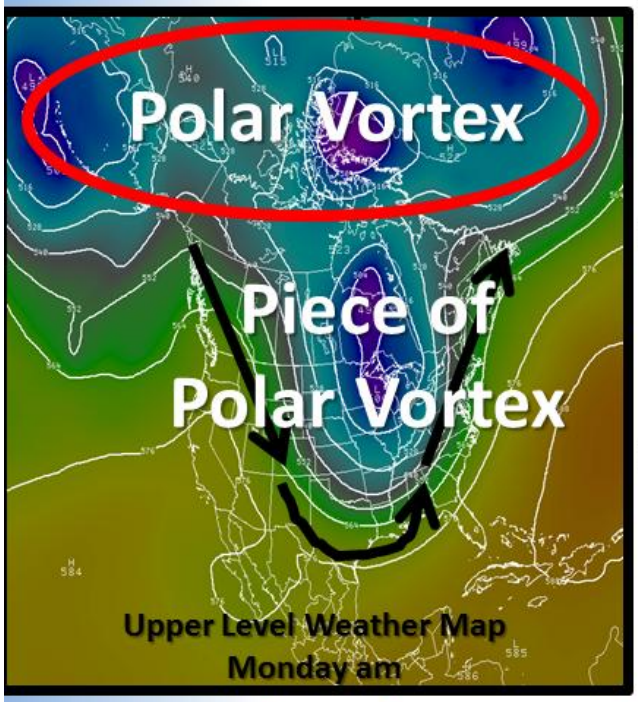
Jersey Devil Weather

609-839-6992

jerseydevilweather@comcast.net

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

What is the Polar Vortex?



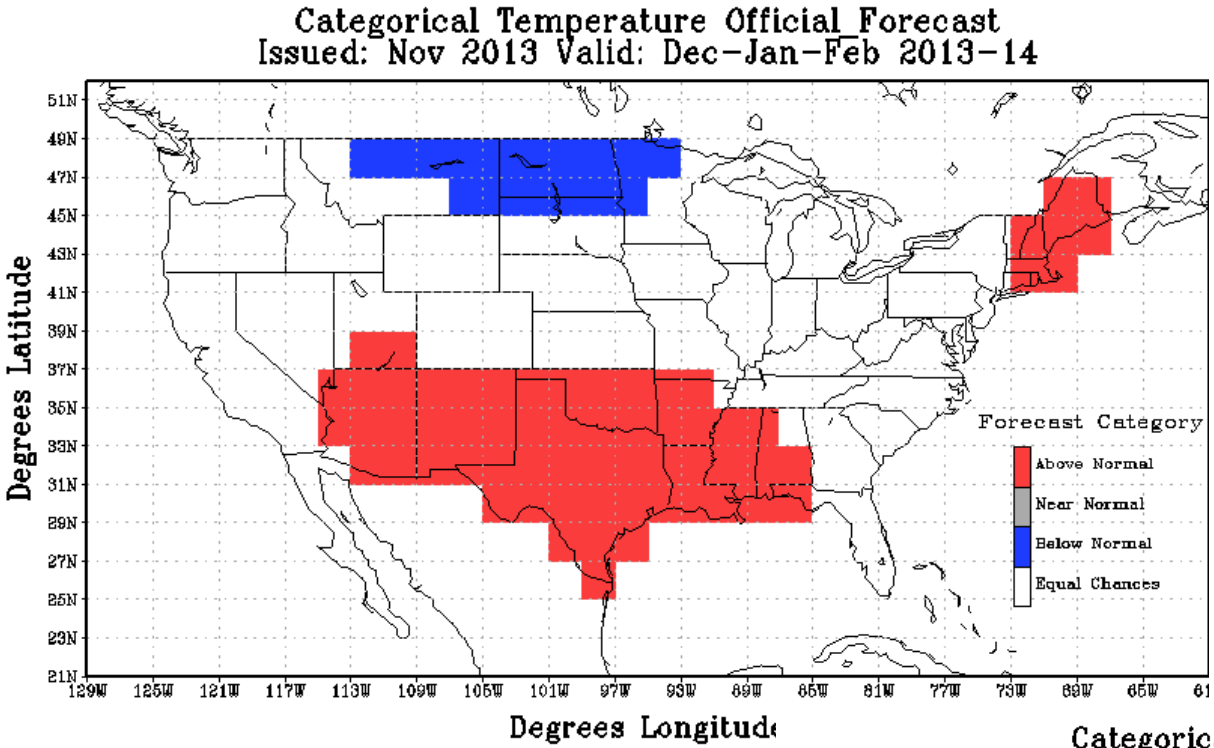
- A persistent, large-scale upper level cyclone near one or both of earths poles.
- It ***ALWAYS*** exists at the poles, but weakens in summer and strengthens in winter.
- Many times in winter, a piece of the vortex breaks off and is sent southward with the jet stream which is what is happening now.

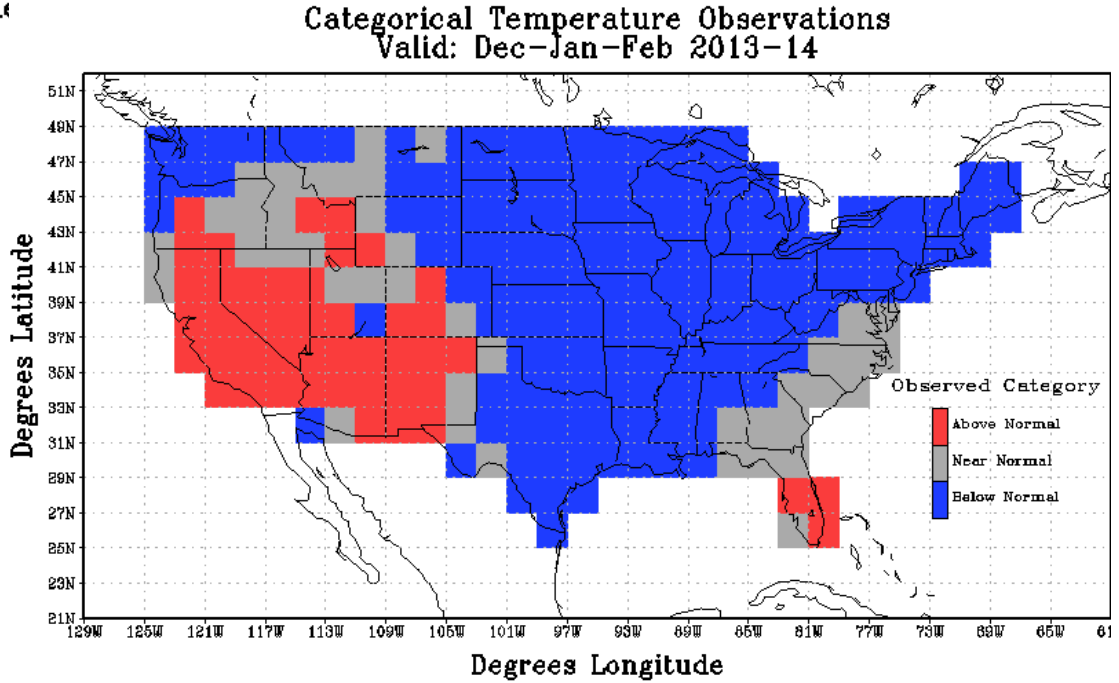
The Polar Vortex is Not……

- is not something new.
- is not something that exists at the earths surface, it is in the upper atmosphere.
- is not something that will be visibly observed like tornadoes, funnel clouds, thunderstorms, lightning etc.
- is not something in itself dangerous to humans, but the cold, arctic air associated with them at the surface could be.

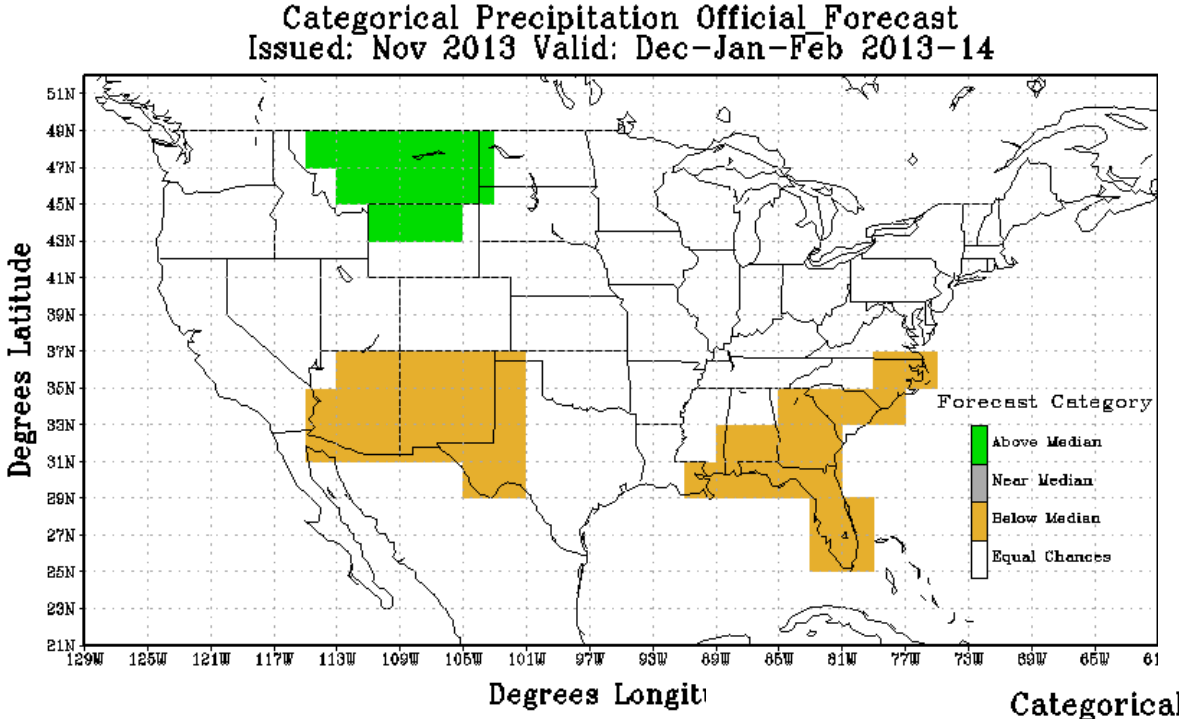
weather.gov/nyc US National Weather Service New York NY @NWSNewYorkNY YouTube NWSNewYorkNY

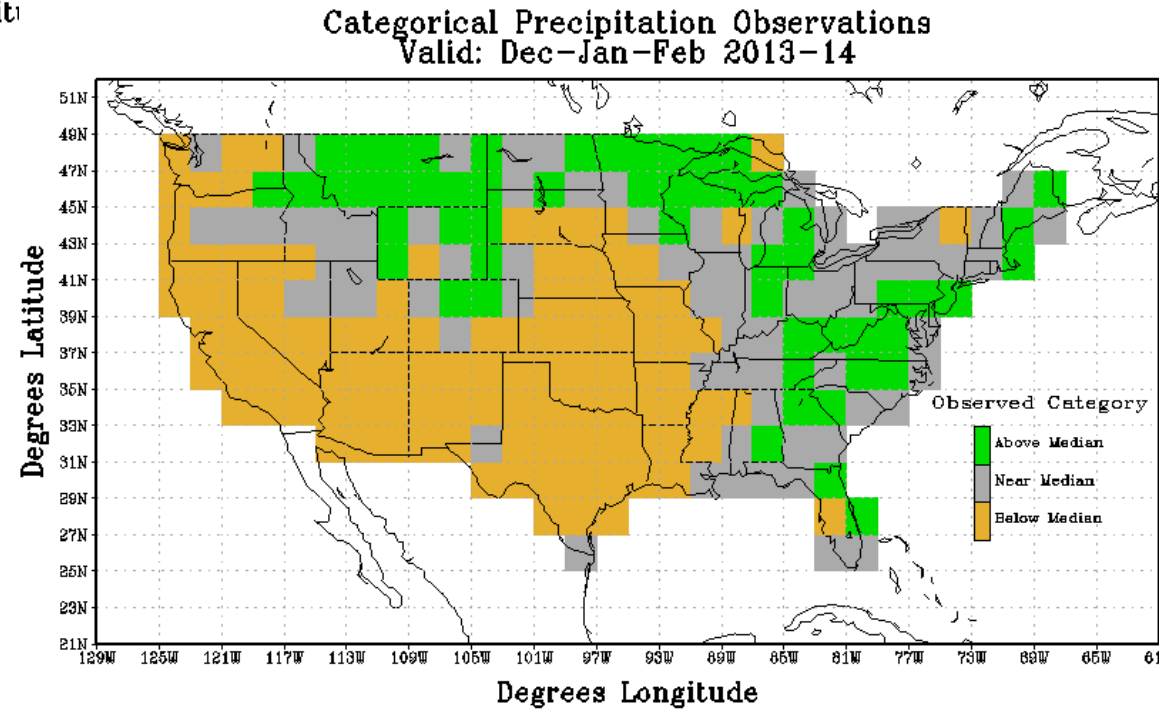
AND – IS NOT CAUSED BY CLIMATE CHANGE

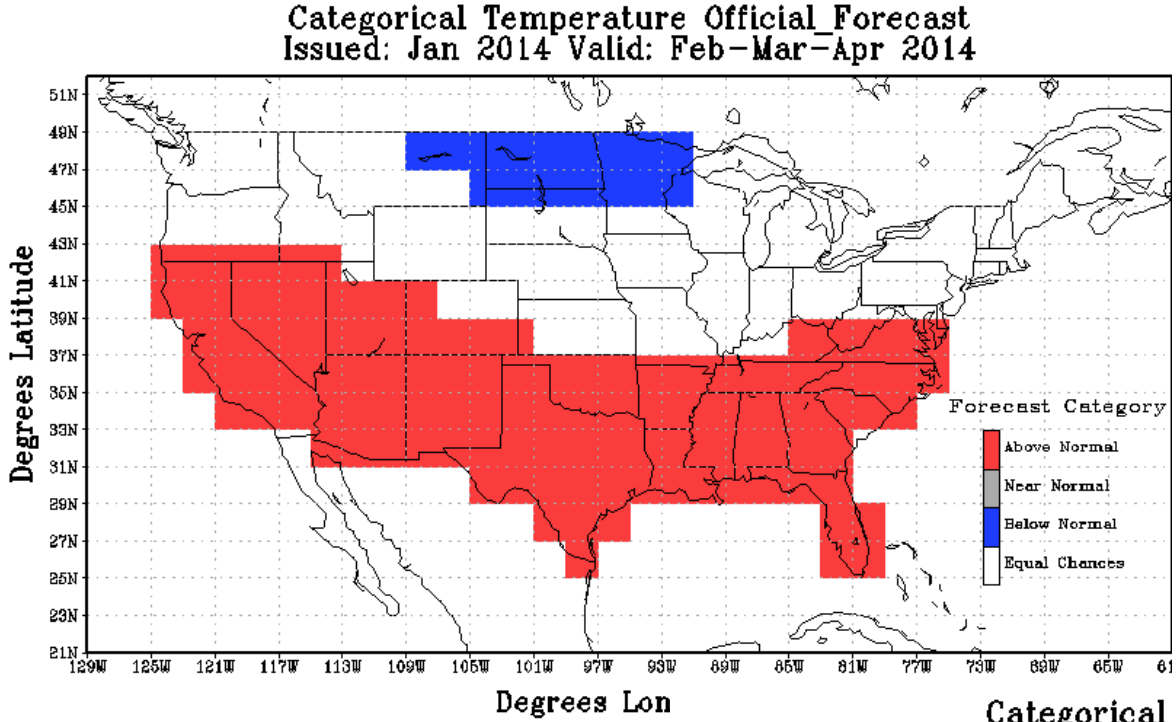


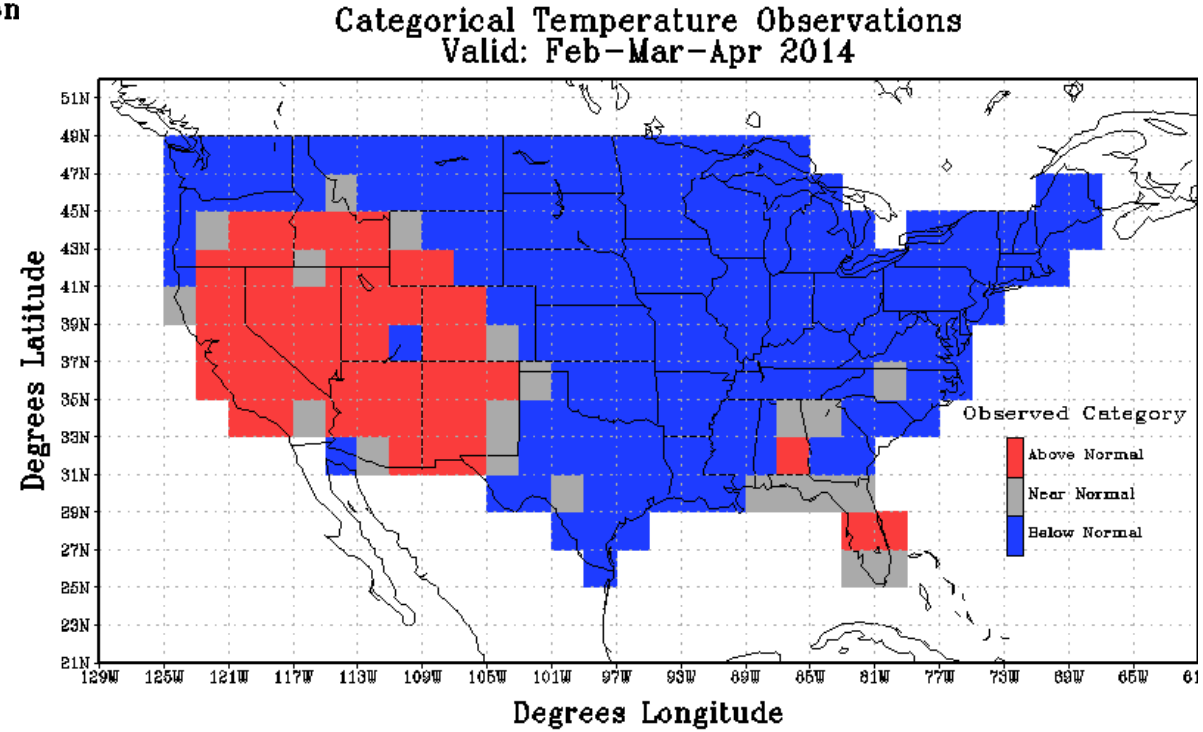


http://www.cpc.ncep.noaa.gov/products/predictions/90day/

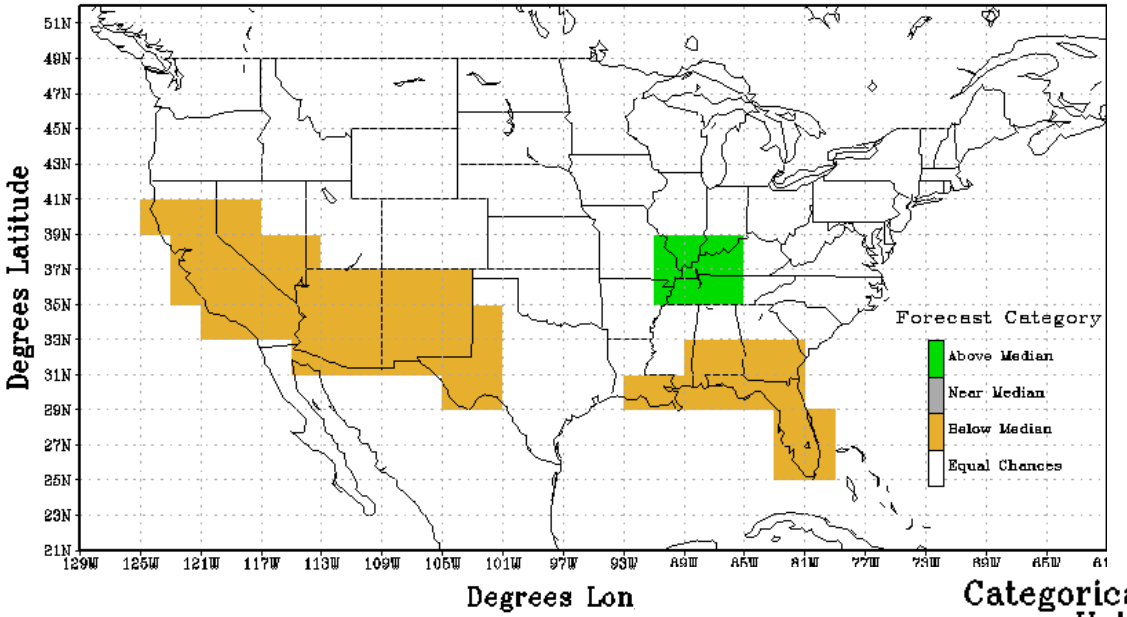

Categorical Precipitation Official_Forecast
Issued: Nov 2013 Valid: Dec-Jan-Feb 2013-14
Degrees Latitude
Degrees Longit
Forecast Category
Above Median
Near Median
Below Median
Equal Chances


Categorical Precipitation Observations
Valid: Dec-Jan-Feb 2013-14
Degrees Latitude
Degrees Longitude
Observed Category
Above Median
Near Median
Below Median

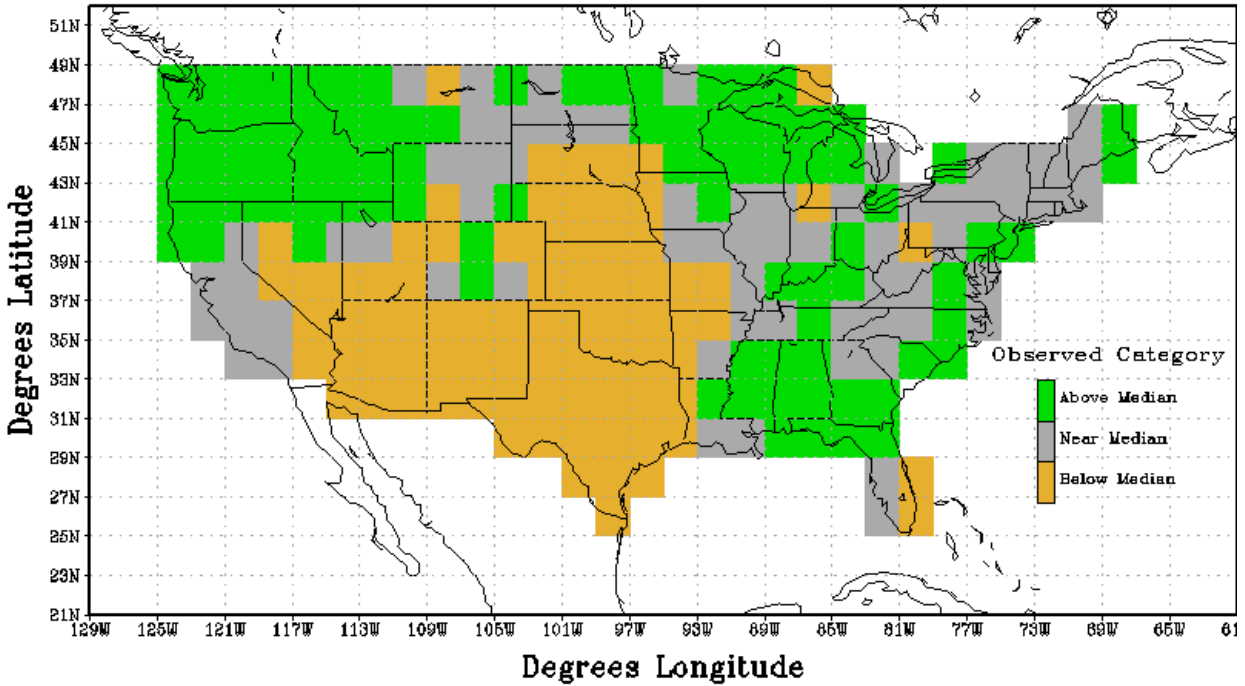

Categorical Temperature Official_Forecast
Issued: Jan 2014 Valid: Feb-Mar-Apr 2014
Degrees Latitude
Degrees Lon
Forecast Category
Above Normal
Near Normal
Below Normal
Equal Chances

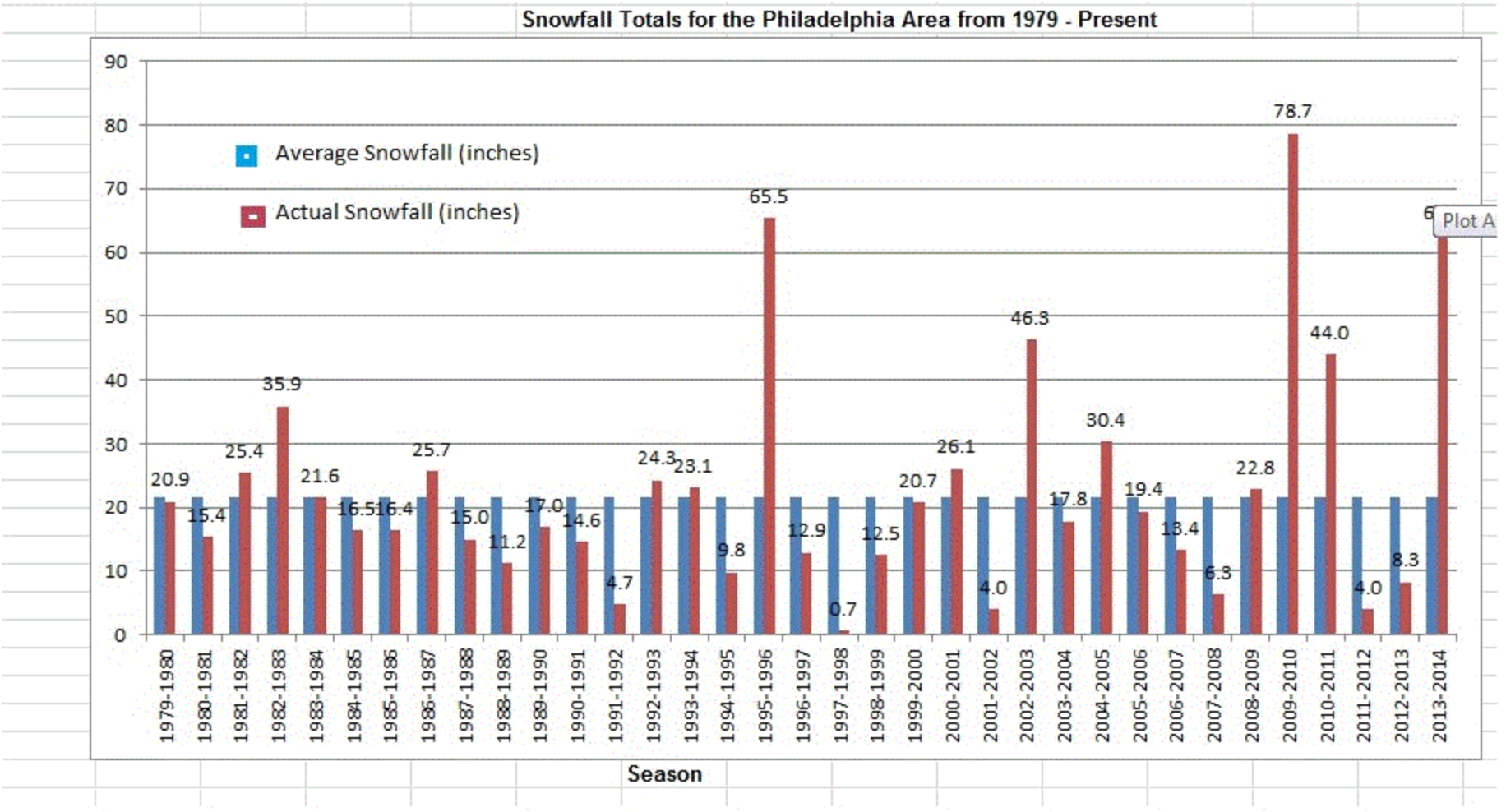

Categorical Temperature Observations
Valid: Feb-Mar-Apr 2014
Degrees Latitude
Degrees Longitude
Observed Category
Above Normal
Near Normal
Below Normal

Categorical Precipitation Official_Forecast
Issued: Jan 2014 Valid: Feb-Mar-Apr 2014



Categorical Precipitation Observations
Valid: Feb-Mar-Apr 2014




Snowfall Totals for the Philadelphia Area from 1979 - Present
Average Snowfall (inches)
Actual Snowfall (inches)
Season
90
80
70
60
50
40
30
20
10
0
20.9
15.4
25.4
35.9
21.6
16.5
16.4
25.7
15.0
11.2
17.0
14.6
4.7
24.3
23.1
9.8
65.5
12.9
0.7
12.5
20.7
26.1
4.0
46.3
17.8
30.4
19.4
13.4
6.3
22.8
78.7
44.0
4.0
8.3
1979-1980
1980-1981
1981-1982
1982-1983
1983-1984
1984-1985
1985-1986
1986-1987
1987-1988
1988-1989
1989-1990
1990-1991
1991-1992
1992-1993
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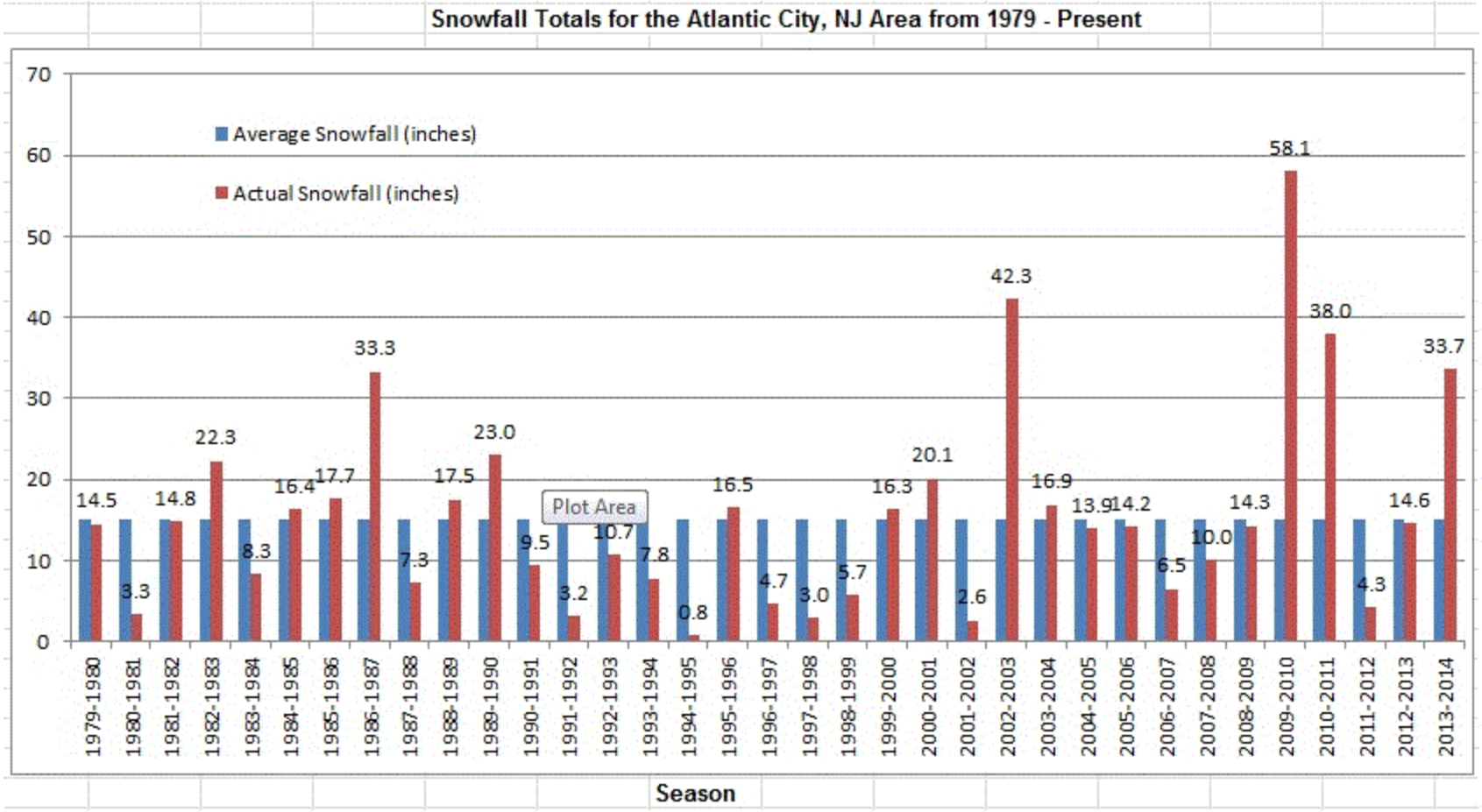
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014


Snowfall Totals for the Atlantic City, NJ Area from 1979 - Present
Average Snowfall (inches)
Actual Snowfall (inches)
Plot Area
Season
70
60
50
40
30
20
10
0
14.5
3.3
14.8
22.3
8.3
16.4
17.7
33.3
7.3
17.5
23.0
9.5
3.2
10.7
7.8
0.8
16.5
4.7
3.0
5.7
16.3
20.1
2.6
42.3
16.9
13.9
14.2
6.5
10.0
14.3
58.1
38.0
4.3
14.6
33.7
1979-1980
1980-1981
1981-1982
1982-1983
1983-1984
1984-1985
1985-1986
1986-1987
1987-1988
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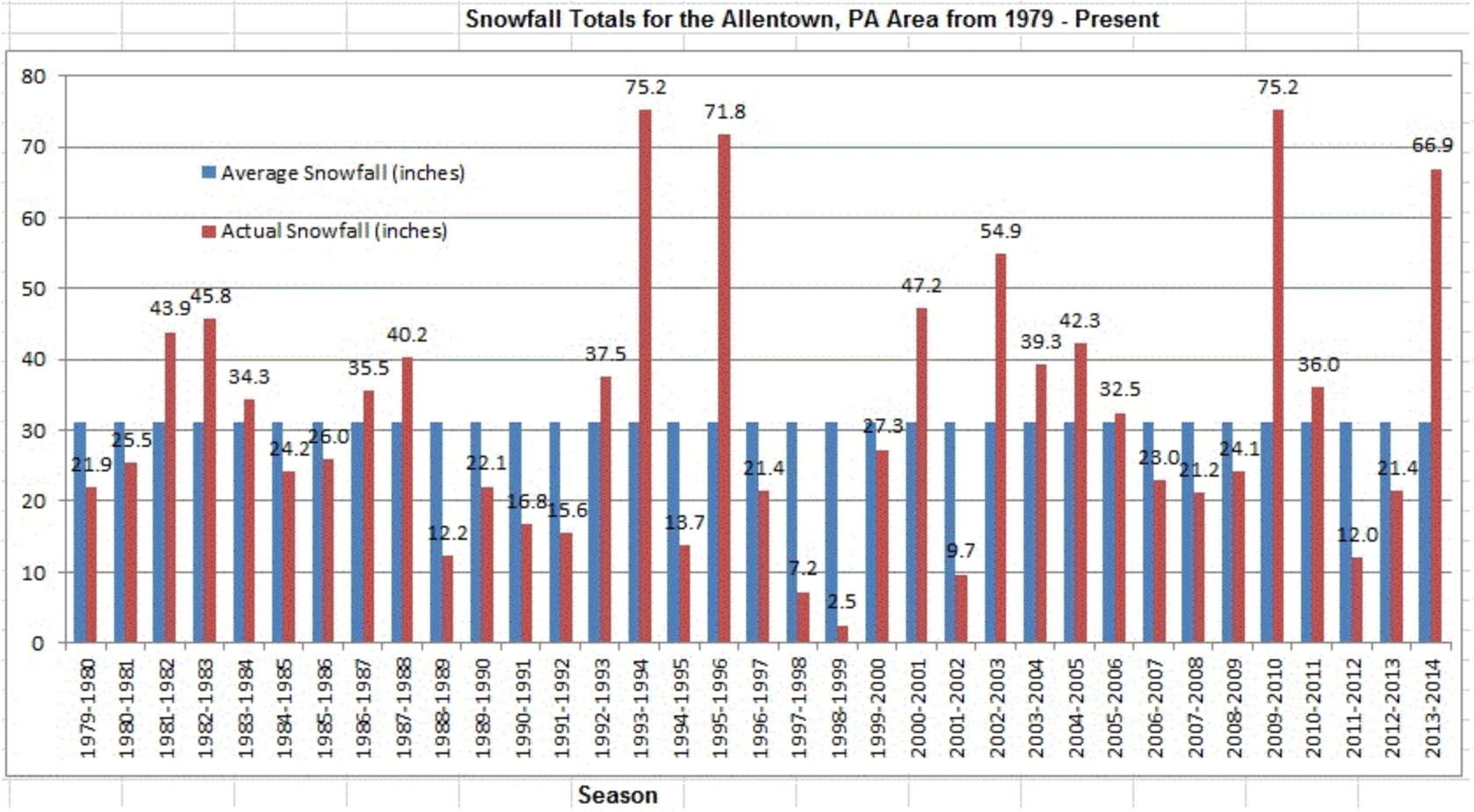
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014

Newark 60.5


Snowfall Totals for the Allentown, PA Area from 1979 - Present
Average Snowfall (inches)
Actual Snowfall (inches)
80
70
60
50
40
30
20
10
0
21.9
25.5
43.9
45.8
34.3
24.2
26.0
35.5
40.2
12.2
22.1
16.8
15.6
37.5
75.2
13.7
71.8
21.4
7.2
2.5
27.3
47.2
9.7
54.9
39.3
42.3
32.5
23.0
21.2
24.1
75.2
36.0
12.0
21.4
66.9
1979-1980
1980-1981
1981-1982
1982-1983
1983-1984
1984-1985
1985-1986
1986-1987
1987-1988
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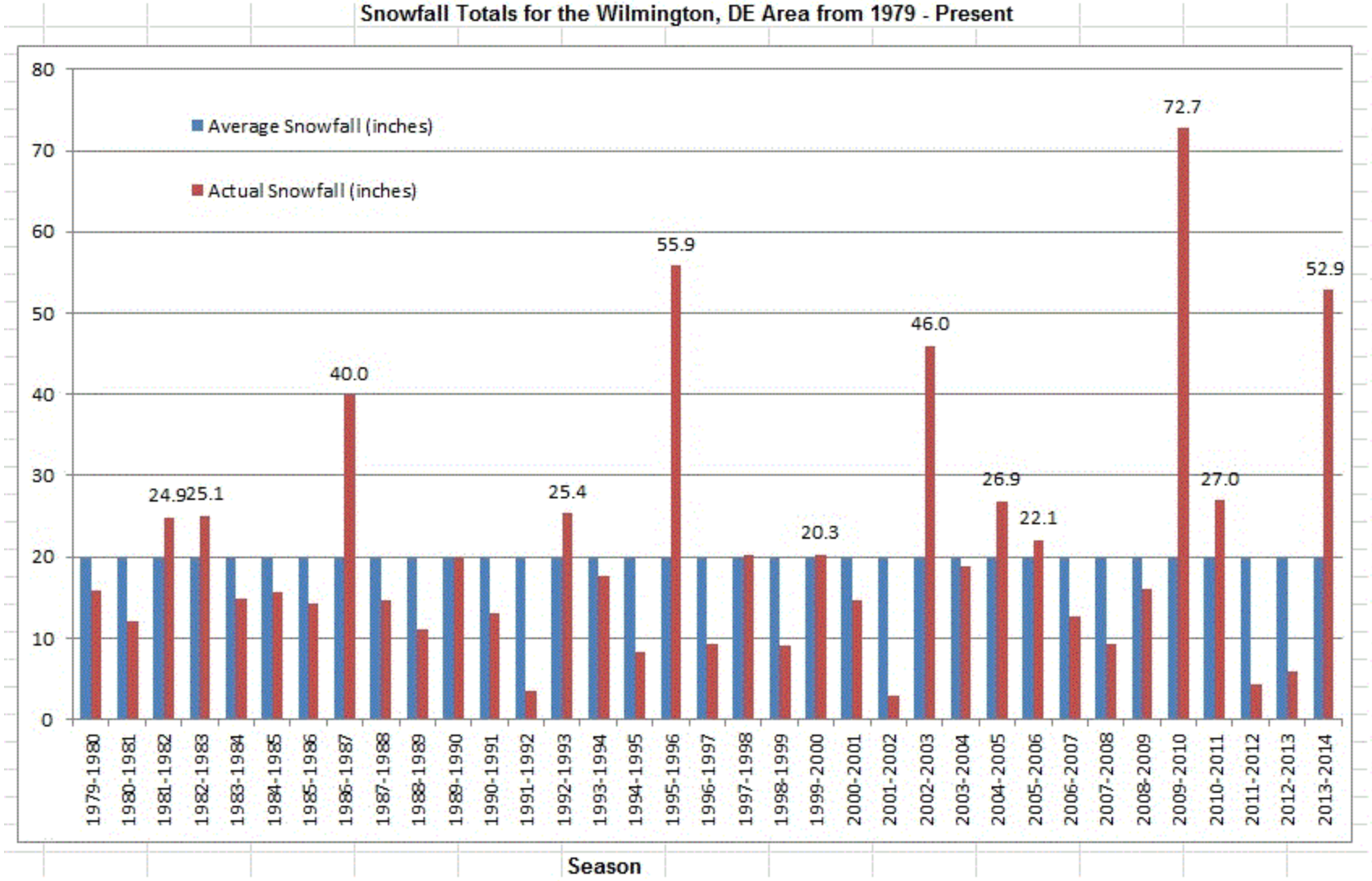
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
Season


Snowfall Totals for the Wilmington, DE Area from 1979 - Present
Average Snowfall (inches)
Actual Snowfall (inches)
80
70
60
50
40
30
20
10
0
24.9
25.1
40.0
25.4
55.9
20.3
46.0
26.9
22.1
72.7
27.0
52.9
1979-1980
1980-1981
1981-1982
1982-1983
1983-1984
1984-1985
1985-1986
1986-1987
1987-1988
1988-1989
1989-1990
1990-1991
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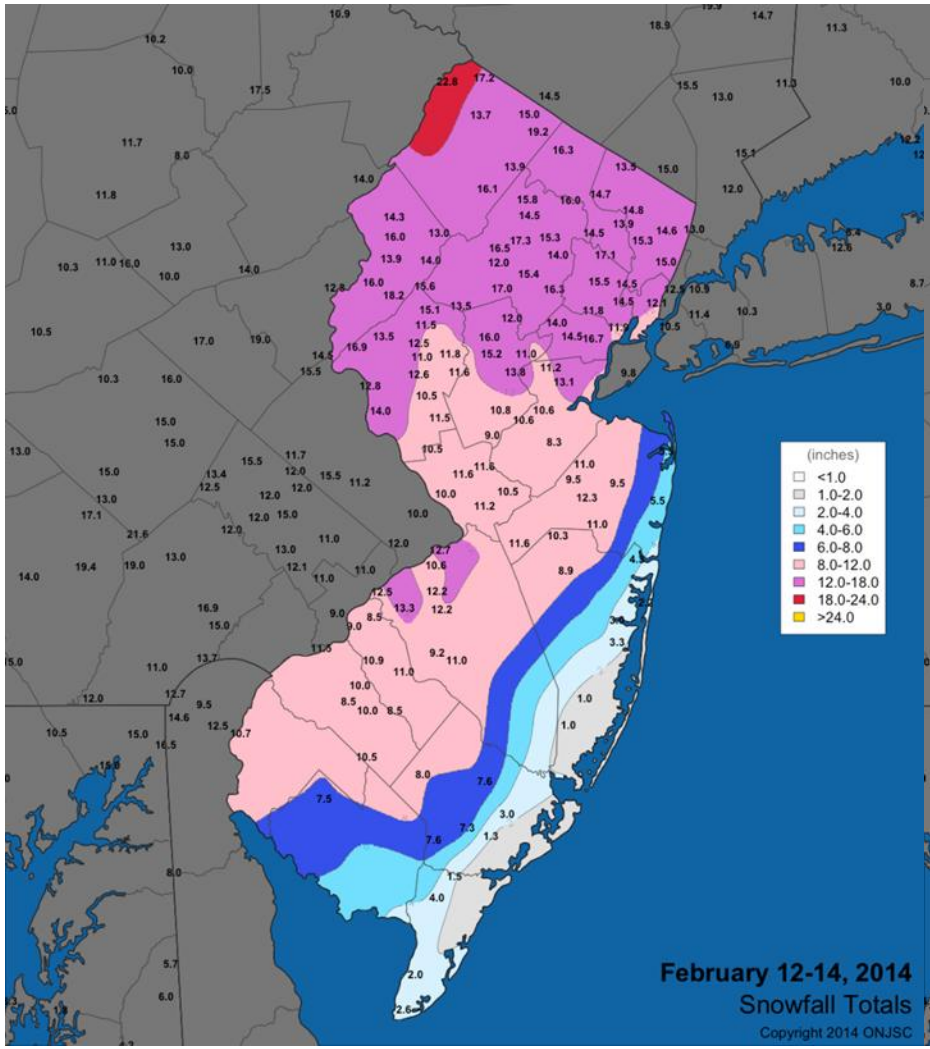
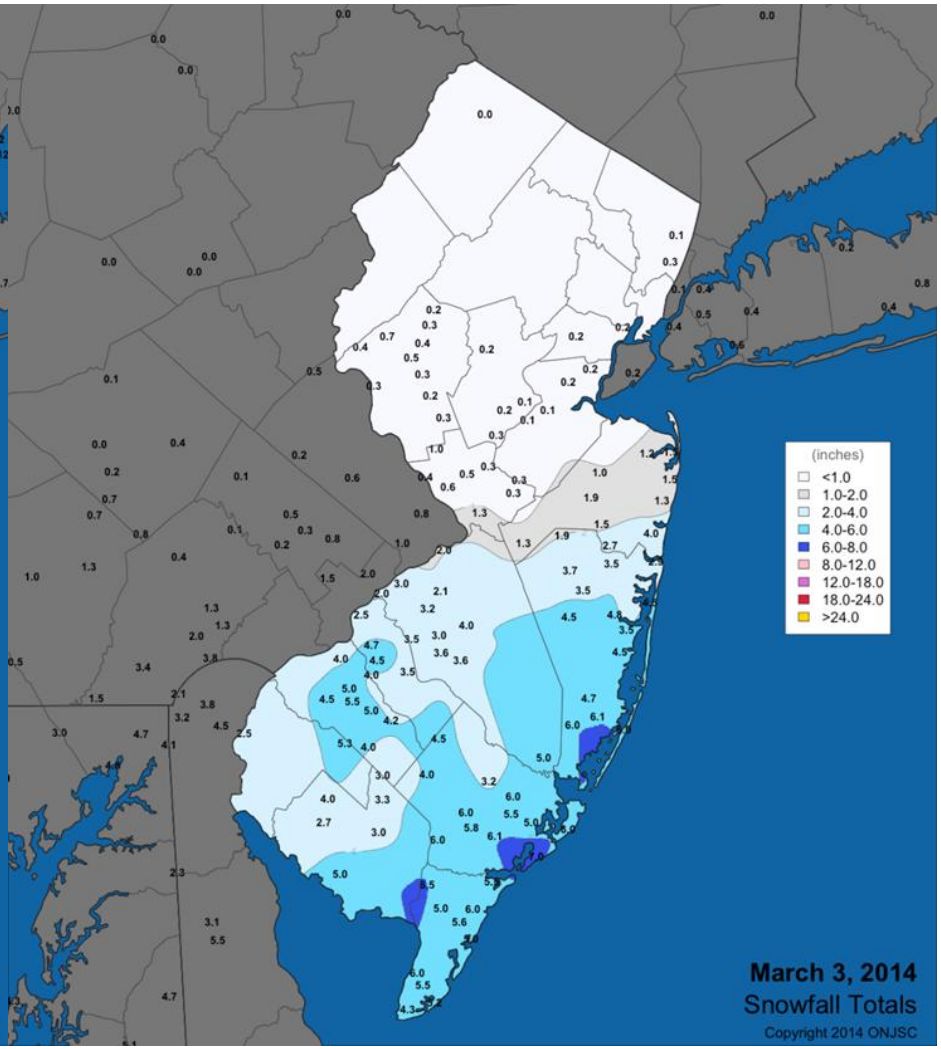
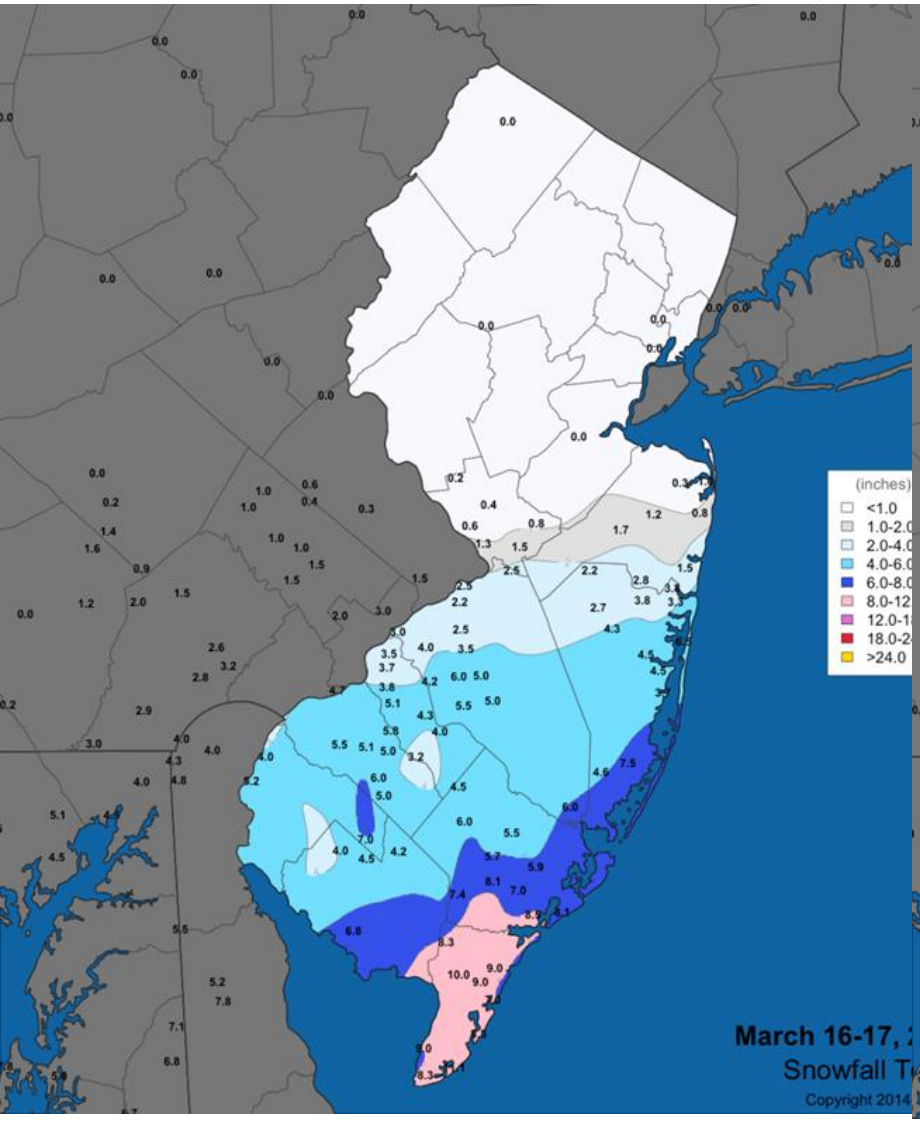
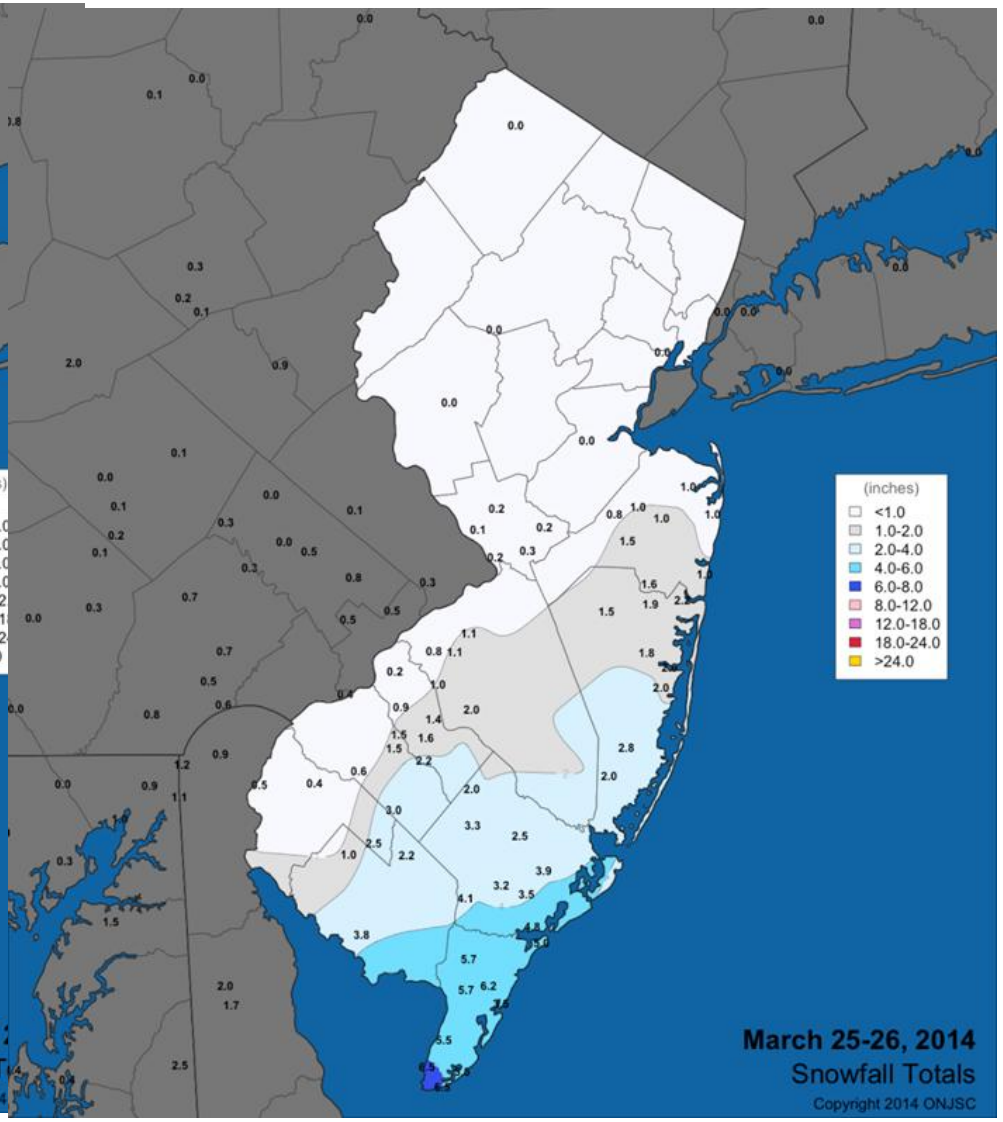
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
Season


(inches)
<1.0
1.0-2.0
2.0-4.0
4.0-6.0
6.0-8.0
8.0-12.0
12.0-18.0
18.0-24.0
>24.0
February 12-14, 2014
Snowfall Totals
Copyright 2014 ONJSC

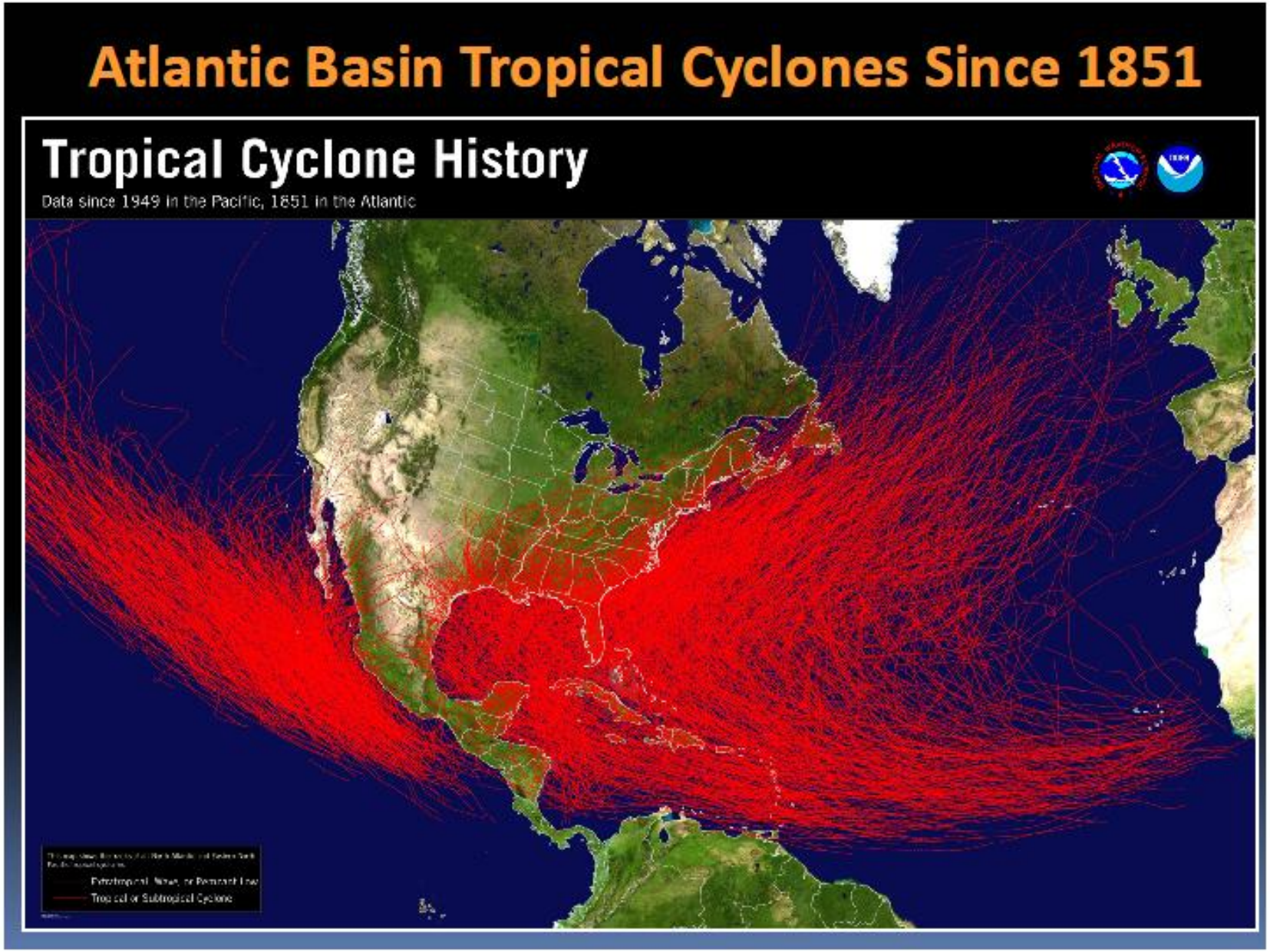

(inches)
<1.0
1.0-2.0
2.0-4.0
4.0-6.0
6.0-8.0
8.0-12.0
12.0-18.0
18.0-24.0
>24.0
March 3, 2014
Snowfall Totals
Copyright 2014 ONJSC


(inches)
<1.0
1.0-2.0
2.0-4.0
4.0-6.0
6.0-8.0
8.0-12.0
12.0-18.0
18.0-24.0
>24.0
March 16-17, 2
Snowfall T
Copyright 2014


(inches)
<1.0
1.0-2.0
2.0-4.0
4.0-6.0
6.0-8.0
8.0-12.0
12.0-18.0
18.0-24.0
>24.0
March 25-26, 2014
Snowfall Totals
Copyright 2014 ONJSC

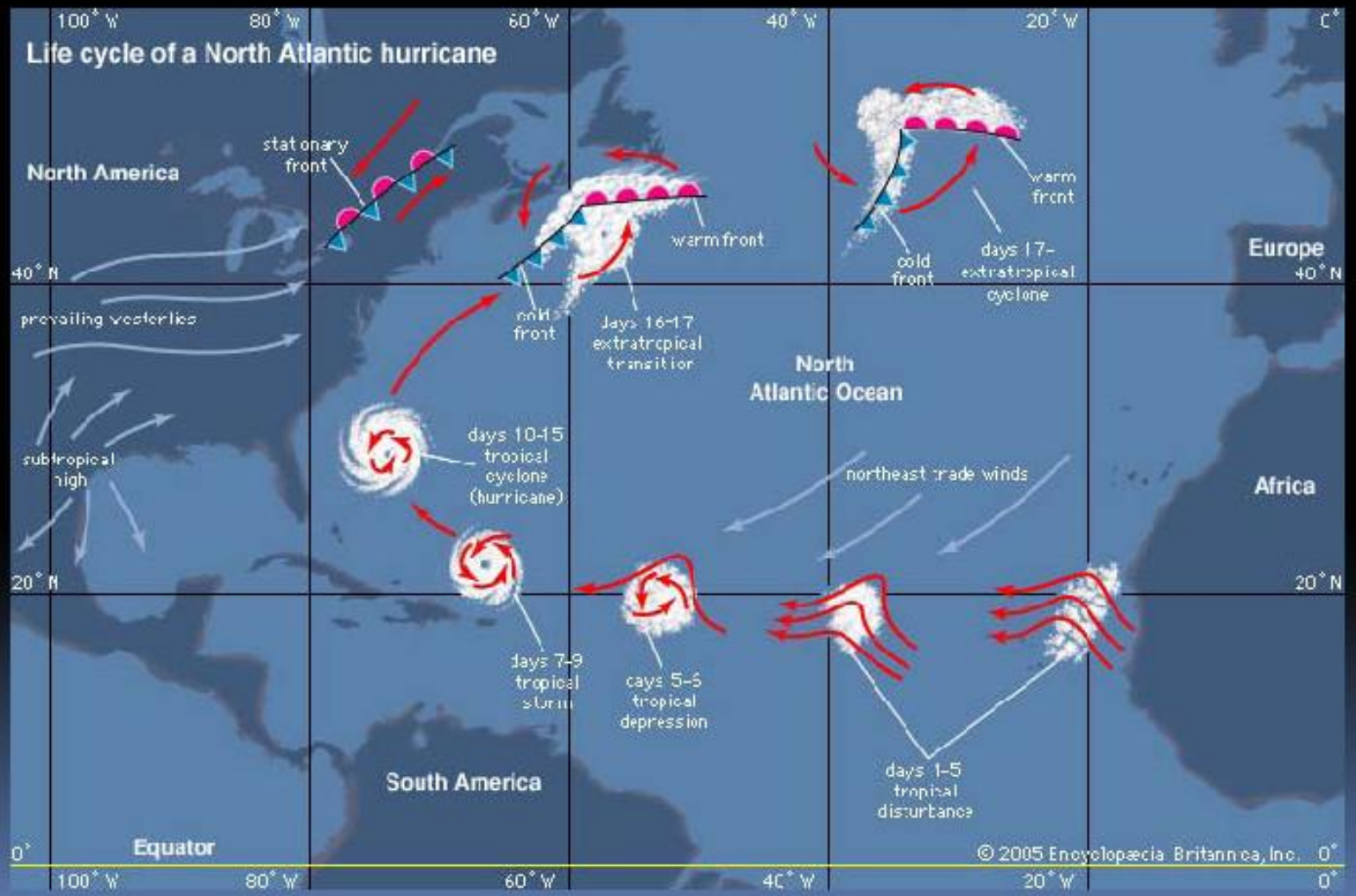
HURRICANES

Atlantic Basin Tropical Cyclones Since 1851



http://www.nhc.noaa.gov/

Life Cycle of a Cape Verde Hurricane



ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2014

Forecast Parameter and 1981-2010 Median (in parentheses)	Issue Date 10 April 2014
Named Storms (NS) (12.0)	9
Hurricanes (H) (6.5)	3
Major Hurricanes (MH) (2.0)	1

Dr. William Gray- Colorado State

http://hurricane.atmos.colostate.edu/Forecasts

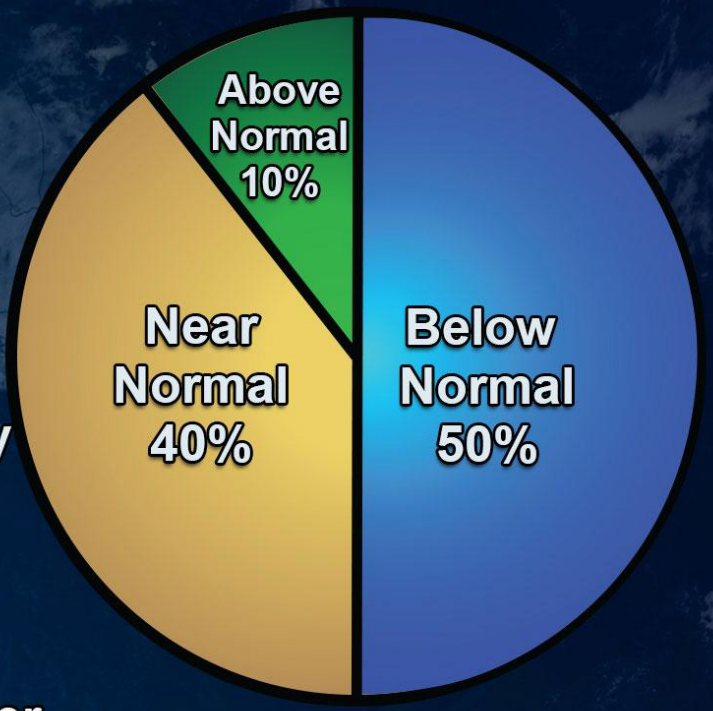
And still another forecast – 9	4	1

The early outlook released March 24, 2014 calls for 11 named storms, including five hurricanes, two of which are predicted to attain major hurricane status (Category 3 or stronger on the Saffir-Simpson Hurricane Wind Scale).

http://www.weather.com/news/weather-hurricanes/hurricane-season-outlook-atlantic-2014-el-nino-20140324

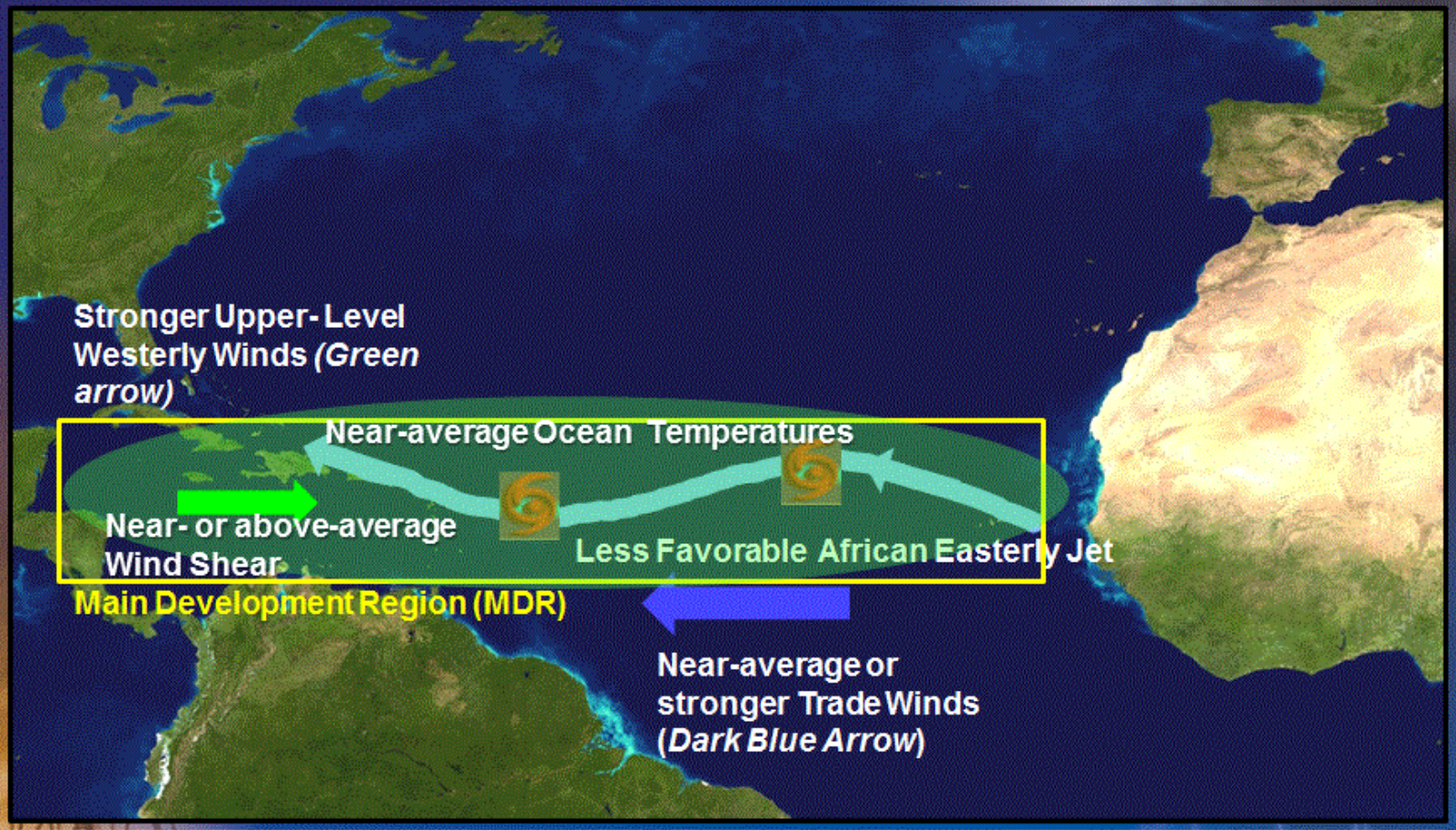
2014 Atlantic Hurricane Outlook

Named Storms:	8 - 13
Hurricanes:	3 - 6
Major Hurricanes:	1 - 2



Be prepared: Visit hurricanes.gov
and follow @NWS and @NHC_Atlantic on Twitter

Conditions Expected During the 2014 Atlantic Hurricane Season



The expected atmospheric and oceanic conditions across the MDR during 2014 suggest a near- or below-normal Atlantic hurricane season.

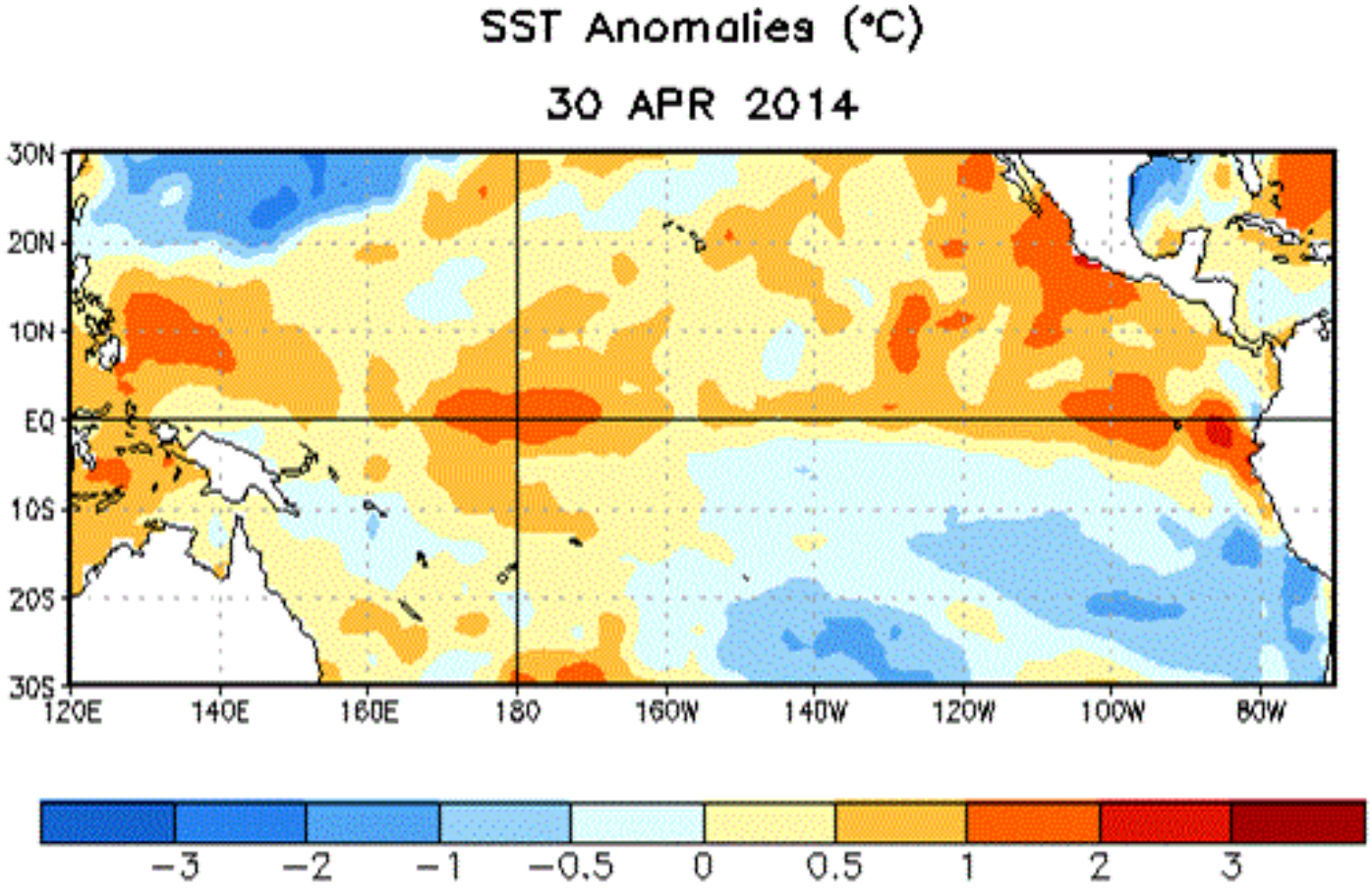
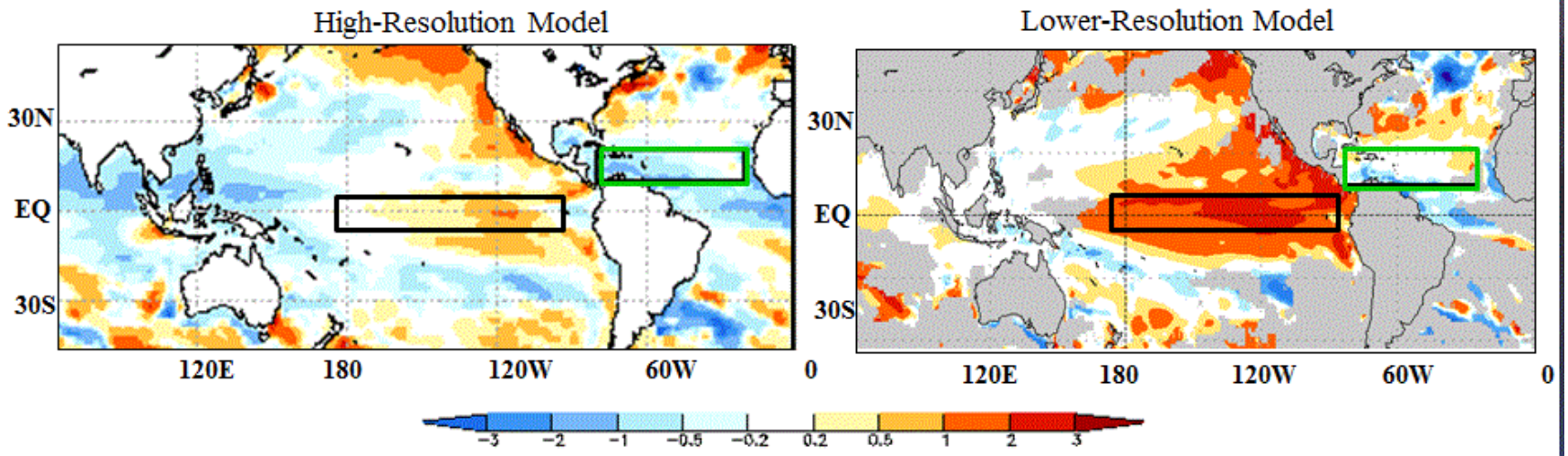


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 30 April 2014. Anomalies are computed with respect to the 1981-2010 base period weekly means.

Sea Surface Temperature Forecast From NOAA's Climate Forecast System (CFS)

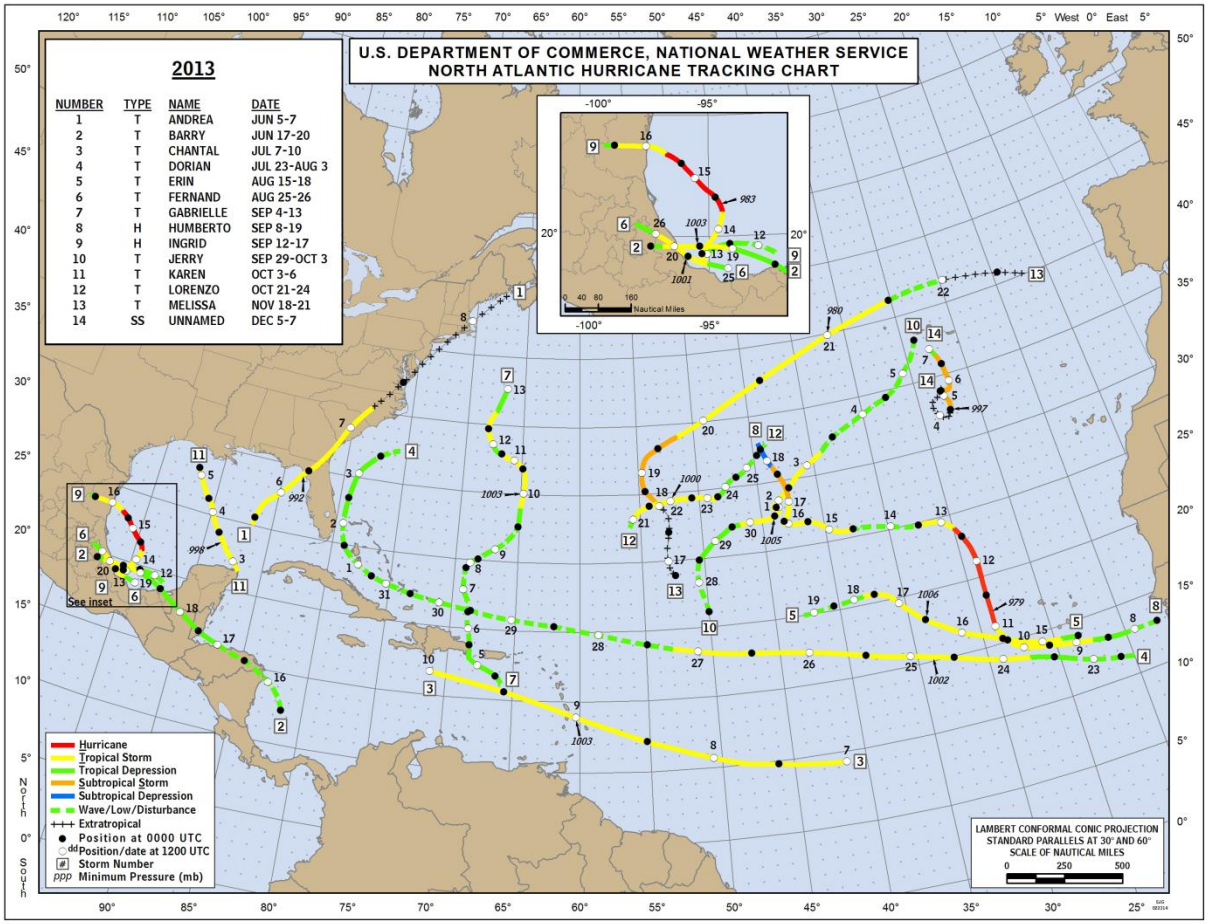


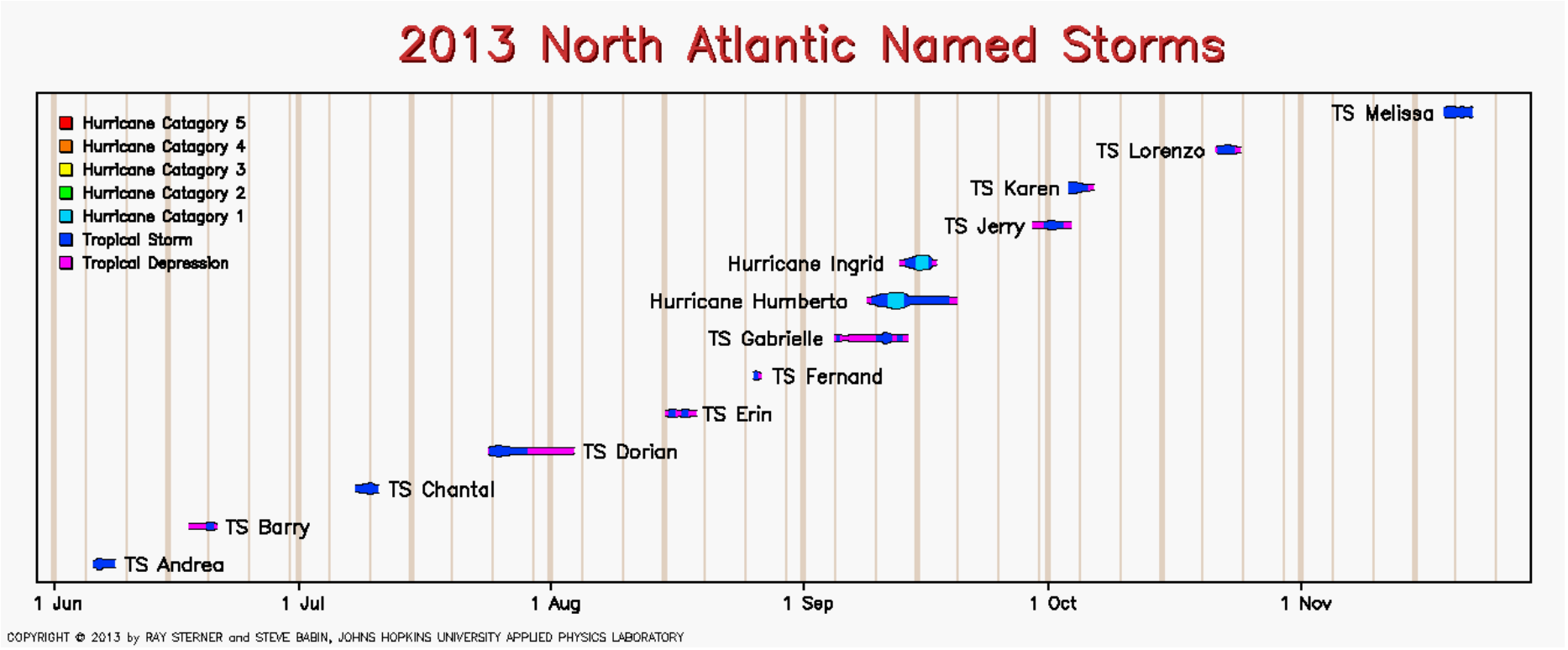
Caption: Predicted sea surface temperature (SST) anomalies (°C) for August-October 2014 from NOAA's Climate Forecast System (CFS). The high-resolution (T-382) forecast is on the left and the lower-resolution T-126 forecast is on the right. Anomalies are departures from the 1982-2009 means. The El Niño region is indicated by the black box. The MDR is indicated by the green box.

For August-October (ASO) 2014, NOAA's CFS predicts below-average SSTs in the Atlantic hurricane Main Development Region (MDR, Green box). The lower-resolution model (Right) is predicting El Niño to form sooner and to be stronger than the high-resolution model (Left).

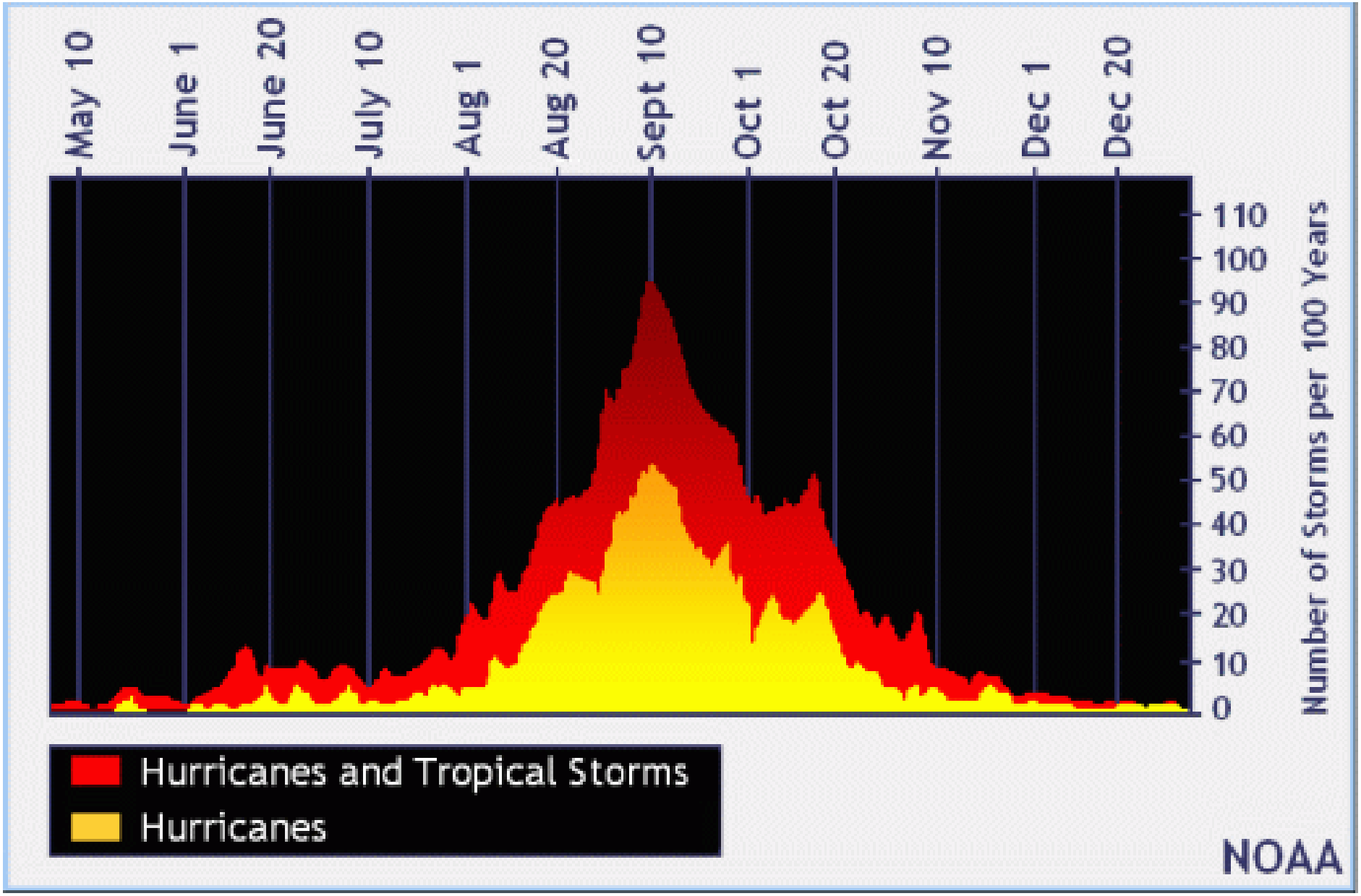
A new report from NOAA's Climate Prediction Center suggests changes could be on the way for weather patterns across the U.S. and the globe.

According to the report, the chance of an El Niño reemerging this year has increased. And, if the models from the report play out, that could mean fewer named storms in the 2014 Atlantic hurricane season and potential drought relief for parts of California later this year.





http://meto.umd.edu/~stevenb/hurr/


May 10
June 1
June 20
July 10
Aug 1
Aug 20
Sept 10
Oct 1
Oct 20
Nov 10
Dec 1
Dec 20
110
100
90
80
70
60
50
40
30
20
10
0
Number of Storms per 100 Years
Hurricanes and Tropical Storms
Hurricanes
NOAA

1935 Keys hurricane upgraded to strongest on record

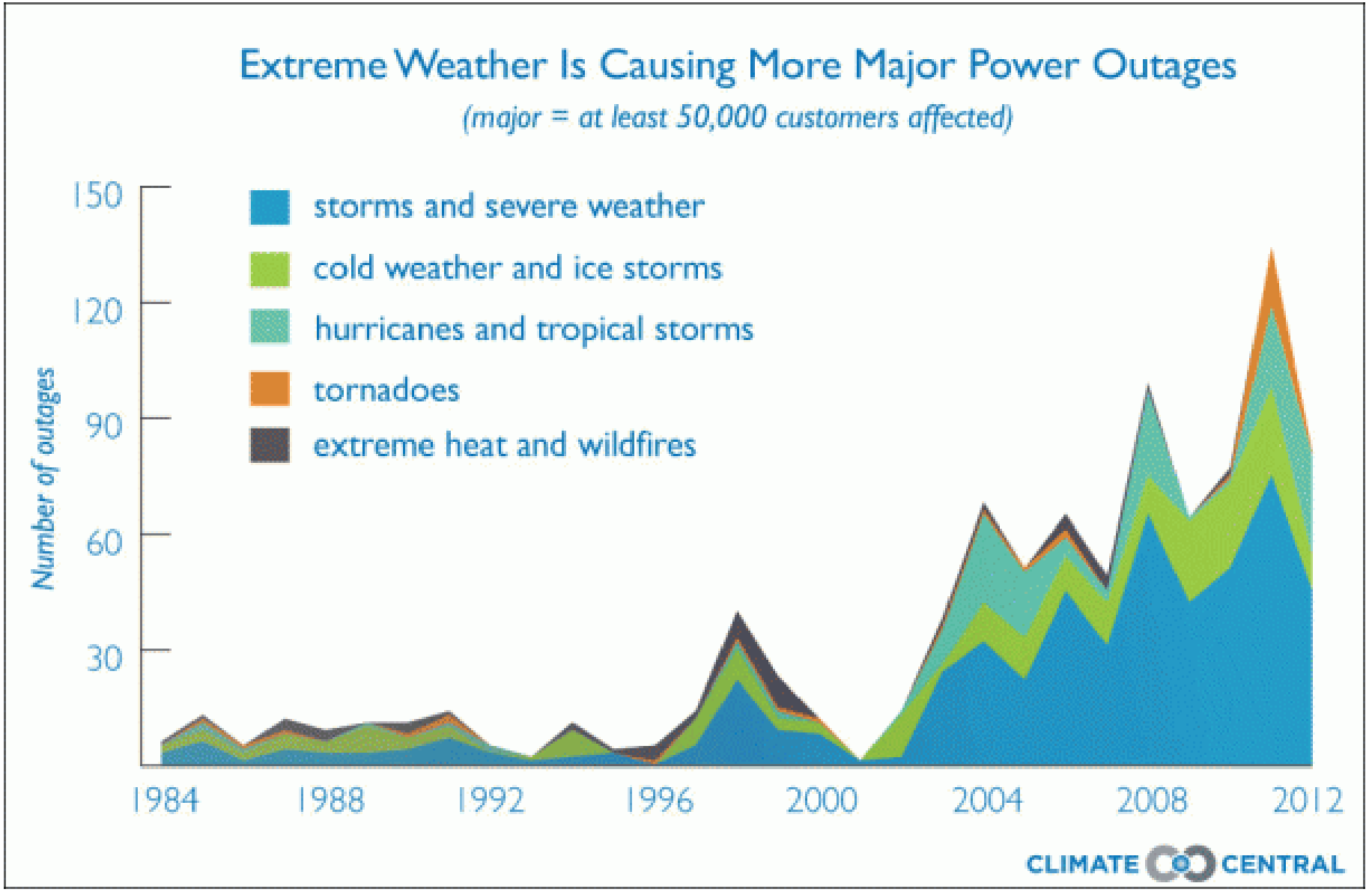
April 21, 2014|By Ken Kaye, Sun Sentinel

The top 10 most intense Atlantic hurricanes
Storms are shown at their peak strength, not at landfall.

Wilma, 2005 — 882 mb — 185 mph; hit Mexico, Florida
Gilbert, 1988 — 888 mb — 185 mph; hit Jamaica, Mexico
Labor Day, 1935 — 892 mb — 185 mph; hit the Upper Keys
Rita, 2005 — 895 mb — 180 mph; hit Texas
Allen, 1980 — 899 mb — 190 mph; hit Haiti, Mexico, Texas
Camille, 1969 — 900 mb — 175 mph; hit Mississippi
Katrina, 2005 — 902 mb — 175 mph; hit Florida, Louisiana, Mississippi
Mitch, 1998 — 905 mb — 180 mph; hit Honduras, Florida
Dean, 2007 — 905 mb — 175 mph; hit Mexico
Ivan, 2004 — 910 mb — 165 mph; hit Alabama, Florida

Source: National Oceanic and Atmospheric Administration

AFTER 10 YEARS, HURRICANE ANDREW GAINS STRENGTH –August 21, 2002


Extreme Weather Is Causing More Major Power Outages
(major = at least 50,000 customers affected)
storms and severe weather
cold weather and ice storms
hurricanes and tropical storms
tornadoes
extreme heat and wildfires
Number of outages
150
120
90
60
30
1984
1988
1992
1996
2000
2004
2008
2012
CLIMATE CENTRAL

State Rankings of Weather-Related Power Outages Between 2003-2012.

State	Weather-Related Outages
Michigan	71
Texas	57
Ohio	54
Pennsylvania	52
Virginia	52
Maryland	50
North Carolina	48
California	46
Illinois	39
Indiana	39
Georgia	37
Louisiana	32
New York	32
Florida	31
Alabama	29
Kentucky	29
Mississippi	25
Arkansas	22
New Jersey	22
West Virginia	22
Washington	19
South Carolina	17
Tennessee	17
District of Columbia	16
Delaware	16

State	Weather-Related Outages
Massachusetts	15
Maine	12
Missouri	12
Connecticut	10
Minnesota	10
Oklahoma	8
New Hampshire	7
Wisconsin	6
Iowa	5
Oregon	5
Colorado	3
North Dakota	3
Nebraska	3
Hawaii	2
Idaho	2
Kansas	2
Rhode Island	2
South Dakota	2
Arizona	1
Montana	1
New Mexico	1
Utah	1
Vermont	1
Wyoming	1

CLIMATE CENTRAL

Climate change is, at most, partially responsible for this recent increase in major power outages, **which is a product of an aging grid serving greater electricity demand**, and an increase in storms and extreme weather events that damage this system. But a warming planet provides more fuel for increasingly intense and violent storms, heat waves, and wildfires, which in turn will continue to strain, and too often breach, our highly vulnerable electrical infrastructure.

147 million customers lost power, for at least an hour and often far longer, from weather-related outages since 2003, an average of 15 million customers affected each year. Currently, there are 145 million customers in the U.S. A customer is a home or a business, or anyone who receives a bill from a utility, so the number of people affected by outages is likely much higher, from 300 million to perhaps half a billion or more over the decade analyzed.

Population: With a population of over 312million people and covering 3.79million square miles, the United States is the world's third largest country by both population and land area

http://www.internetworldstats.com/stats8.htm

TOP TEN COUNTRIES WITH THE HIGHEST POPULATION

#	Country	2000 Population	2010 Population	2012 Population	2050 Expected Pop.
1	China	1,268,853,362	1,330,141,295	**1,343,239,923**	1,303,723,332
2	India	1,004,124,224	1,173,108,018	**1,205,073,612**	1,656,553,632
3	United States	282,338,631	310,232,863	**313,847,465**	439,010,253
4	Indonesia	213,829,469	242,968,342	**248,645,008**	313,020,847
5	Brazil	176,319,621	201,103,330	**193,946,886**	260,692,493
6	Pakistan	146,404,914	184,404,791	**190,291,129**	276,428,758
7	Nigeria	123,178,818	152,217,341	**170,123,740**	264,262,405
8	Bangladesh	130,406,594	156,118,464	**161,083,804**	233,587,279
9	Russia	146,709,971	139,390,205	**142,517,670**	109,187,353
10	Japan	126,729,223	126,804,433	**127,368,088**	93,673,826
TOP TEN Countries		3,618,894,827	4,016,489,082	**4,096,137,325**	4,950,140,178
Rest of the World		2,466,012,769	2,829,120,878	**2,921,709,597**	4,306,202,522
TOTAL World Population		6,084,907,596	6,845,609,960	**7,017,846,922**	9,256,342,700

Obama Says Climate Change Growing Threat to Health

Obama warns of 'devastating' hurricanes from climate change

Earlier this month, hundreds of scientists declared that climate change is no longer a distant threat – it 'has moved firmly into the present,'" Obama said. "Its costs can be measured in lost lives and livelihoods, lost homes and businesses; and higher prices for food, insurance, and rebuilding.

John Kerry Calls Climate Change a 'Weapon of Mass Destruction'

Feb. 16, 2014

By GILLIAN MOHNEY via World News

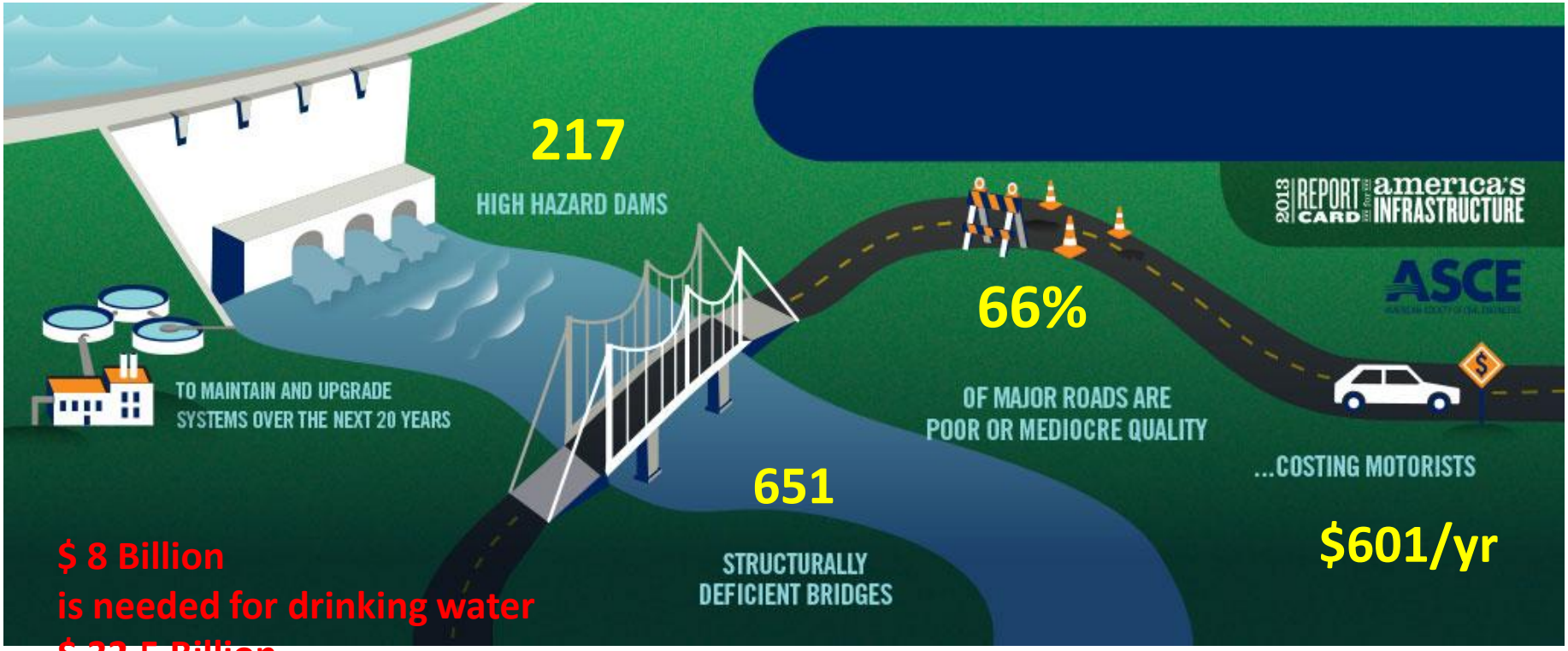
EPA Chief: Seas Will Rise, Temperatures Will Soar Without Government Action on Climate Change

McCarthy also blamed climate change on rising medical bills, higher insurance costs, and an increased frequency in devastating storms.

"Climate inaction is costing us more money, in more places, more often," she said. "2012 was the second most expensive year in U.S. history for natural disasters."

Canada Cracks Down on Scientists Who Talk About Climate Change

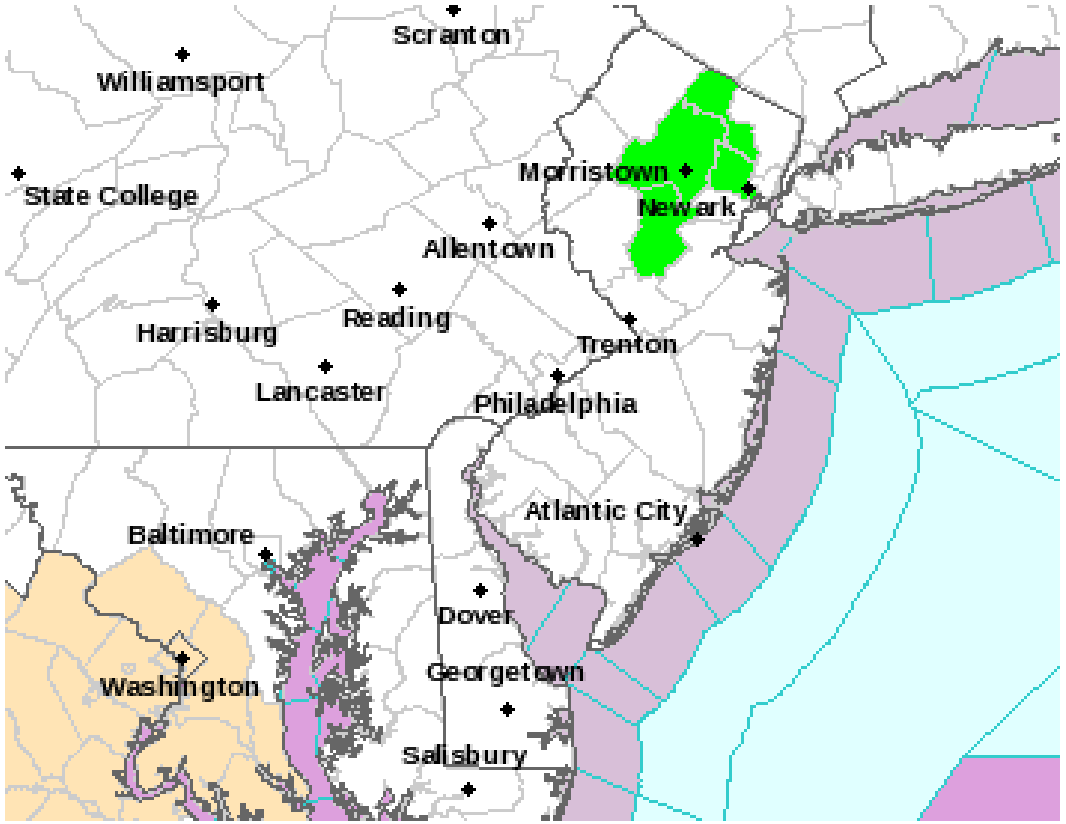
The government tells its meteorologists to focus on the day-to-day weather, and forget about longer-term trends



$ 8 Billion
is needed for drinking water
$ 32.5 Billion
is needed for wastewater

Pennsylvania- C- Maryland – C-

Weather Briefing and Other Information for Emergency Managers Working Together To Save Lives



http://www.erh.noaa.gov/phi/emerman.php